

Appendix 6 (Additional Peer Review Comment)

In addition to the independent peer review discussed in Appendix 4, ARB solicited an additional review from Professor Philip K. Hopke of Clarkson University on the proposed the methodology for estimating diesel PM concentrations. His comments are on the next page.

Review of the methodology for estimating diesel PM concentration
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I have been asked to comment on the methodology used to estimate diesel PM concentrations based on NO_x measurements. I have reviewed the portion of the report covering the methodology (Appendix 3) and the comments of some of the primary reviewers of the methodology (Jeffrey Brook and Richard Flagan).

The result presented look quite reasonable in terms of the relationships between diesel PM and ambient NO_2 concentrations. Obviously a key question is what other major sources of NO_x are typically present in the areas of California where the data were obtained. There is limited home heating and large utilities so that traffic is likely to be the main source of NO_x emissions. Within traffic, diesels are much larger NO_x sources relative to spark-ignition. It would be good to make these assumptions about the unique nature of the area under study more explicit since in many other areas of the country, they would not hold and applying a similar methodology would not be likely to succeed.

The averaging of data to get annual averages at the 11 sites from Children's Health Study potentially hides a great deal of variability. There is no indication of standard deviations or other measures of variability in the points. It would be useful to see the original data since they are 2-week duration samples so there is considerable averaging already done at the basic sample level. To what extent is there seasonal variability although again California does not really have seasonality in temperatures like many other locations in the United States. It would be good to have a better feeling for the likelihood of error in estimation as a function of time of year.

It is quite possible to estimate NIOSH values of OC and EC from IMPROVE data with a reasonable r^2 given that there were collocated IMPROVE and STN samplers in Fresno. Thus, the DRI analyses could be redone with NIOSH like data to see if they come closer to the Schauer values. It would be useful to explore the problems of the different OC/EC methods on the results a bit further to see if there is a clearer overall average α that would be more applicable on a statewide basis.

They eliminate a point from the top figure in Figure 2 to the bottom, but provide no statistical basis for eliminating this point. What outlier tests were used? One cannot throw away points simply because they do not fit.

I agree with Dr. Brook's comments with regards to the source apportionment work and the estimation of the α . They are too easily dismissing the DRI value and EC is generally a better tracer of diesel PM than is OC particularly in newer diesel vehicles. Zn, Cu, Ca, and to a lesser extent Si and Fe are commonly associated with diesel PM. His comments on the EI estimates are also quite useful.

I am confused because Prof. Flagan's comments are identical to Dr. Brook's so it seems that something is missing or misplaced.

Overall the basic conceptual framework of this approach appears sound, but it would be good to clearly state the assumptions, look more carefully at the unaggregated data, and look at how the differences in OC/EC measurements might be resolved.